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*An Ingenious proposal for a new sort of Maps of Count-
trys, together with Tables of Sands and Clays,
such chiefly as are found in the North parts of Eng-
land, drawn up about 10 years since, and delivered
to the Royal Society Mar. 12. 1683. by the
Learned Martin Lister M. D.*

WE shall then be better able to judge of the make
of the *Earth*, and of many *Phænomena* belonging
thereto, when we have well and duely examined
it, as far as human art can possibly reach, beginning from
the *outside* downwards. As for the more *inward* and *Central*
parts thereof, I think we shall never be able to con-
fute *Gilbert's* opinion thereof, who will, not without Rea-
son, have it altogether *Iron**. And for this purpose it
were advisable, that a *Soil* or *Mineral Map*, as I may call
it, were devised. The same *Map* of *England* may, for
want of a better, at present serve the Turn. It might
be distinguisht into *Countries*, with the *River* and some of
the noted *Towns* put in. The *Soil* might either be co-
loured, by variety of *Lines*, or *Etchings*; but the great
care must be, very exactly to note upon the *Map*, where
such and such *Soiles* are bounded. As for example in
Yorkshire (1.) The *Woods*, Chaulk, Flint, and Pyrites, &c.
(2.) *Black moore*; *Moore*s, Sandstone, &c. (3.) *Holder-
ness*; *Boggy*, Turf, Clay, Sand, &c. (4.) *Western Moun-
tains*; *Moore*s, Sand-stone, Coal, Iron-stone, Lead Ore,
Sand, Clay, &c. *Nottinghamshire*, mostly Gravel Pebble,
Clay, Sand-stone, Hall-playster, or *Gypsum*, &c. Now
if it were noted, how far these extended, and the limits of
each *Soil* appeared upon a *Map*, something more might

* *De Magn. Lib. 1. Cap. 17. Tellus in interioribus partibus magneticam
homogenicam naturam habet.*

be comprehended from the whole, and from every part, then I can possibly foresee, which would make such a labour very well worth the pains. For I am of the opinion, such upper *Soiles*, if natural, infallibly produce such *under Minerals*, and for the most part in such order. But I leave this to the industry of future times.

I shall entertain you at present, with a *Scheme of Sand*, and another of *Clay*, such only which I have had the chance to meet with in *England*. As for the *Sand*, I have some reasons to think, that it was once, the most exterior and general cover of the surface of the whole Earth. Because all our *Northern Mountains* are more or less covered with it at this day, and the higher the *Mountains*, still the more, and the courser the *Sand*: Because the *Rivers* arising in the *Mountains* do yet daily bring it down in great quantities, and that it has been so in all probability, in all Ages, since the first rains fell upon the face of the Earth, which seems to me to be truth like, in that the *Sea-shoares*, or Mouths of *Rivers*, are usually barr'd with it; Besides the *Sandy Sea Grounds* in most places of the *Sea*; and (which seems a clear evidence for the length of time) for that, the low grounds near these *Rivers* (which have been in all ages upon Record, *Mosses*) if you pierce so deep into them, as to discover their bottom; you meet with this *Mountain Sand* in great quantities, and in some places a *Mosse* under that, and the same Sand-beds under that. Now if we consider how long these *Mosses* or *Turf* is in growing, it being mostly the leaves and roots of Plants, we must allow very many Ages for this purpose. And although *Herodotus* one of the most Ancient *Historians* that are, boldly conjectures that *Agypt* long before our times, would be dammed up and useless by the great plenty of *Mud* yearly brought down that vast River; yet it does not appear, that the *Country* is much different from what it was in his time, so that the *Sand* and *Mud* is still carryed to Sea.

Another

Another Argument of the Sands being the *Universal Cover* of the face of the Earth is, from the great hardness, and consequently the durableness, and unalterable quality of this *Mineral*, above any other in *Nature*. For though many things are called *Sand*, from the smallness and little Cohæsion, or dryness of the grains, yet this kind of *Mountain Sand* above all others keeps its natural and original magnitude, and is not made (as most Sand is) by the Attrition and wearing of one particle of stone against another; But is of a constant and durable figure; and therefore, I say, it seems to me for this reason to be the most fit for an *outside* or *cover* to the *Globe* of the Earth.

And if it shall be objected, that although we grant the high Mountains of *England* and *Europe*, are usually first bedded with *Sand-Rocks*, if not still covered in many places with loose sand, yet are there other *Mountains*, as the *high Woolds* all over *England*, not so, but their uppermost beds of stone are soft Chaulk. and on the smooth surface no appearance of any *Sand*. This indeed is in part granted; but that there is no where any *Sand*, upon the *Chaulk Mountains*, is not true; for to instance in those inland *Sand Hills* above *Bulloine* in *Piccardy*, which sand is the very same with that on the Sea shoar at *Calais*, and although this is not *England*, yet the Sea hath but accidentally divided us: for from *Dunstable* Ex. gra. in *England*, even as far as the *Walls* of *Paris* by *Calais*, is as it were a continued *Woolds* of *Chaulk* and *Flint*. What difference there is betwixt the *Woolds* Mountain sand, and that of the *Northerne Mountains* will best appear in the Table. Now the nakedness of the *Woolds*, is from the smallness of its sand, which readily yielded not only to the *Rain* that fell, but to the *Wind* also. Which is evident from that vast tract of sandy Hills, which bound the coasts of *France*, *Flanders*, and *Holland*, and which have made their *Coasts* so shallow in respect of *ours*, as being

in great part blown off the *Yorkshire, Lincolnshire, Suffolk, or Essex*, and *Kentish Woods*, and wrapt up upon their *Coasts*; and the reason of this is partly from the more constant *Westerly* winds blowing over from our *Coasts*; and also from the meeting of the two *Tydes*, viz. that of the *Channel*, and that other of *North Flood* upon their *Coasts*.

I am well aware, that the finding of *Cockles* or *Shells*, as most *writers* are pleased to call them, upon *Mountains*, and sand also there, is by the same *Herodotus* used as an Argument of a great *Deluge*, or inundation of waters; but as I have elsewhere I think demonstrated, that the *Rock-Cochlites* are no *Shells*, so neither can I grant that the *Sand* was adventitious to the *Mountains*, but naturally originated there; for that it is there plainly to be found, some loose, and the rest in Beds, yet unloosened; as I could name very many places, for instance, *Silden* and *Thorpe Fells* in *Craven*, this *Mountain Sand* is a white and transparent pebble, and some of it is small and easily swept and blown away, so is there much of it upon the high *Mountains* mixt with white pebbles of greater Size.

'Tis the *Character* of this sand, not to yeild to fire, as *Flint* will do; and though it agree with that and some other *metalls*, to strike fire from *Steel*, yet it does not *calcine*, as *Flint* will be brought to doe. And therefore this *Sand* is the true *Tarso* of the *Italian Mountains*, of which the fine *Venetian Glass* is made; and for this reason, the *Flint-Glasses* were here in *England* ill compounded, the *Forreiners* mistaking the *materials*, which yet our *Country* affords in plenty, all over the *Northern*, and (I doubt not) the *Westerne* mountains too: I have seen from the *Scotch* mountains very excellent and large.

A Table of Sand (drawn up about X. years since) such chiefly as I have found in the Northern parts of England.

Sand.	Sharpe or Rag-Sand, composed of small transparent pebbles, naturally found upon the Mountains, not calcinable.		
	{ Fine		
		{ White	{ <i>Stitneham</i> Moor in the Road wash'd up very white Pebble. <i>Flamborough</i> head, of which the Light house there is cemented.
		{ Grey	{ <i>Calice</i> Sand; burns reddish, but falls not in water. <i>Seaton</i> Banks near <i>Hartlepool</i> or the <i>Tees</i> mouth, <i>Escrick</i> , in the Gravell pit there.
		{ Reddish	{ A vein of exceeding fine Sand.
		{ Browne	{ The <i>Pillow</i> Sand in the <i>Baltick</i> .
		{	{ In a Spring at <i>Heslington</i> .
		{	{ The Sand at the <i>Bath</i> in <i>Somersetshire</i> .
	{ Courfe		
		{ Greisly	{ <i>Acome</i> near <i>York</i> drifted Sand.
		{	{ <i>Hutton</i> Moor wash'd.
		{	{ <i>Thorpe</i> Fells.
		{	{ <i>Owze</i> at <i>York</i> .
		{	{ <i>Nid</i> at <i>Mountain</i> .
		{	{ Dug up at <i>Rawcliff</i> near <i>Snare</i>
		{	{ <i>Wharfe</i> at <i>Ickly</i> and <i>Denton</i> .
		{	{ <i>Air</i> at <i>Carleton</i> in <i>Craven</i> .
		{	{ <i>Eure</i> at <i>Bolton</i> .
		{ Browne	{ <i>Gauton</i> .
		{	{ <i>Santon</i> in <i>Lincolnshire</i> .
		{	{ <i>Bomeby</i> Common.
		{	{ <i>Skipwith</i> Common.
	{ Soft or smooth with flat particles.		

{	From Limestone.	{	At in <i>Yorkshire</i> .
		{	A Vein at <i>Oswell</i> Beacon in <i>Lincolnshire</i> .
{	With <i>Mica</i> of Glittering particles,		
	Silver like	{	Sea sand about the <i>Sylly</i> Islands.
		{	In <i>Cleveland</i> and about <i>Scarborough</i> .
		{	<i>Ouze</i> dust, or sediment at <i>Raw-cliff</i> .
{	Gold like	{	A Vein of <i>Mica</i> in <i>Heslington</i> Gravel Pit.
		{	<i>Mica Argentea</i> in Red sand Rock near <i>Rippon</i> plentifully.
		{	<i>Mica Aura</i> of <i>Cleveland</i> .

Also I here give a Scheme of *Clays*, as well because it seems to be another Coat of the *Terrestrial Globe* in the more depressed and hollow parts thereof, as because the mixture of *Sand* and *Clay* is not unusually called *Earth*. Yet this terme being too large it will be convenient, as I think, to limit it to such a mixture as we usually find upon the surface of the ground, which hath ever in it, besides such *Sands* and *Clays*, as either the *Soyle* naturally produces, or have by *Floods* or *Winds*, or other *accidents* been brought thither, a great part of the rotten parts of *Plants* and *Animals*. And in this sense *Turff* is *Earth*, which is mostly where the *Erica* or *Heath* grows, because it is made up of the deciduous Leaves of that *Plant*, which being by the Current of showr's brought together, make up the *Moores*, *Mosses*, and *Fens*, and in the *Mountains* in hollow Basons or Depressures without Vent; *Mosses* of incredible depth, 1. or 2. *Fathom* ordinarily in the same kind of Black Earth, called *Peat* or *Turff*.

A Table of Clays.

- Pure, that is, such as is soft like Butter to the Teeth, and has little or no greetiness in it.
- Greasy, to be reckoned amongst the Medicinal Earths, or *Terræ Sigillatæ*.
1. Fullers Earth
 - Yellowish { At *Brickhili* in *Northamptonshire*.
 - { At under the *Yorkshire* Woolds.
 - Brown about *Hallifax*.
 - White in *Derbyshire* Lead Mines.
 2. Boli { In *Cleveland*.
 - { At *Linton*, upon *Wharfe*.
 3. Pale yellow, in the Marle pit at *Ripley*.
 4. Cow shot clay, or the Soap scale lying in Coal Mines.
 5. A dark blew-clay or Marle at *Tolthorp*.
- Harsh and dusty when dry.
6. Creta properly so called, or the Milk white Clay of the Isle of *Wight*.
 7. The Potters pale yellow Clay of *Wakefield* Moor.
 8. The Blew Clay of *Bullingbrook* Pottery in *Lincolnshire*.
 9. A Blew clay in *Bugthorp* Beck, in which the *Astroites* are found.
 10. Yellow Clay in the seams of the Red sand Rock at *Bilbro*.
 11. Fine red clay in Red sand { at *Bilbro* Rock, { at *Rippon*.
 12. A soft chalky blew clay } { at *Buttercraim*.
 13. A soft chalky red clay } {
- Stony when dry.
14. A Red stone clay { In the Banks of *Whitcar* beck, near *Leppington*: & at *Hou-*
 15. A Blew stone clay } sam in the *Milicar*.
 16. Clunch, a white stone clay in *Cambridgsh*.
- Mixt with Round Sand or Pebble.
17. The

- { 17. The yellow Loame of *Skipwith Moor*
Yorkshire.
- { 18. A Red sandy clay in the right hand
bank of the Road beyond *Cottingham*,
near the lime Kilns going to -----
- { 19. A Red sandy clay in the Red sand
Rock near *Kippon*.

With flat or thin sand, glittering with *Mica*.

- { 20. *Crouch* white clay *Derbyshire*, of which
the Glas-pots are made at *Ntingham*.
- { 21. Grey or blewish Tobacco Pipe clay
at *Hallifax*.
- { 22. A Red Clay in the Red sand Rock
at *Rotherham*.

Observations